ABSTRACT

An intermetal or interlevel low-k dielectric layer is formed of the hardened cell walls of microorganisms that are filled with air or an inert gas. The method of formation comprises the formation on the substrate of a protective and adhesion enhancing layer. A culture medium is then applied to the protective and adhesion enhancing layer and seeded with living microorganisms. After the seeded layer has attained a desired thickness by growth and multiplication of the microorganisms, the medium is dried by air or an inert gas, sacrificing the microorganisms, hardening their cell walls and replacing their intercellular material with the drying medium. Finally, a capping dielectric layer is formed over the mass of cell material.